WHAT IS CLAIMED IS:

1. A heat exchanger for a vapor compression refrigerant cycle, defining a passage through which a refrigerant having a pressure equal to or higher than a predetermined pressure flows, wherein a refrigerant flow area (S), a length (L), and an equivalent diameter (d) of the passage satisfy the conditional expression $0.04 \times e^{-1.8d} \leq S/L \leq 2.1 \times e^{-1.8d}$.

2. The heat exchanger according to claim 1, wherein the flow area (S), the length (L) and the equivalent diameter (d) of the passage satisfy the conditional expression $0.06 \times e^{-1.8d} \leq S/L \leq 1.0 \times e^{-1.8d}$.

3. The heat exchanger according to claim 1, comprising:

a core portion including a plurality of tubes defining the passages therein and fins interposed between the tubes, wherein the core portion performs heat exchange between the refrigerant and an outside fluid passing outside of the tubes; and

a header tank connected to longitudinal ends of the tubes to communicate with the tubes.

4. The heat exchanger according to claim 3, further comprising:

a separator disposed in the header tank for dividing an inside of the header tank into a plurality of spaces.

5. The heat exchanger according to claim 1, wherein the vapor compression refrigerant cycle includes a compressor for compressing the refrigerant, and the refrigerant, which has been discharged

from the compressor, flows through the passages.

6. The heat exchanger according to claim 1, wherein the refrigerant is carbon dioxide.

7. The heat exchanger according to claim 1, wherein the predetermined pressure is a critical pressure of the refrigerant.

8. A vapor compression refrigerant cycle comprising:

a compressor for compressing a refrigerant; and

a heat exchanger for cooling the refrigerant,

wherein the heat exchanger includes tubes defining refrigerant passages through which the refrigerant flows therein and header tanks connected to longitudinal ends of the tubes,

wherein the passages are defined such that a flow area (S), a length (L), and an equivalent diameter (d) satisfy the conditional expression $0.04 \times e^{-1.8d} \leq S/L \leq 2.1 \times e^{-1.8d}$.

9. The vapor compression refrigerant cycle according to claim 8, wherein the passages are defined such that the flow area (S), the length (L), and the equivalent diameter (d) satisfy the conditional expression $0.06 \times e^{-1.8d} \leq S/L \leq 1.0 \times e^{-1.8d}$.

10. The vapor compression refrigerant cycle according to claim 8, wherein the refrigerant is carbon dioxide and compressed by a pressure equal to or higher than a critical pressure.

11. The vapor compression refrigerant cycle according to claim 8,

wherein the equivalent diameter (d) is obtained by dividing the product of four and a cross-sectional area of one passage by a circumference of the passage.

12. The vapor compression refrigerant cycle according to claim 8, the heat exchanger further includes a separator provided in at least one of the header tanks such that the refrigerant reverses flow in at least one of the header tanks,

wherein the length (L) is obtained by the product of the length of the tube and the number of path, wherein the number of path is obtained by adding the number of times that the refrigerant reverses flow to one, and

wherein the flow area (S) is obtained by dividing the product of a total cross-sectional area of the passages in one tube and the number of tubes by the number of path.